1 PURPOSE

This Chapter provides guidance for the implementation of the Kaiser-Hill Company, L L C (Kaiser-Hill) Rocky Flats Environmental Technology Site, Chronic Beryllium Disease Prevention Program (CBDPP), that supplements and is integrated into existing worker protection programs that are established for Department of Energy (DOE) employees and DOE contractor employees

2. SCOPE

This Chapter applies to all Kaiser-Hill employees and its subcontractors with operations or activities that involve past, present or potential future exposure to beryllium (Be) at the Rocky Flats Environmental Technology Site (Site) during the Site closure and D&D activities
This Chapter does not apply to

- Machining, production-type operations, and/or other non-D&D activities involving beryllium Activities using elemental beryllium in any form to create products must be accomplished under additional requirements
- The use or handling of finished beryllium articles (where the presence of beryllium dust is not also suspected)
- Site laboratory operations that are in compliance with 29 CFR 1910 1450, *Occupational Exposure to Hazardous Chemicals in Laboratories*

This Chapter references the Occupational Medical Department Program Procedures, *Chapter 21,* (PRO-874-OMD01) for the Medical Surveillance Program and the Environmental Systems and Stewardship Group, *Environmental/ Waste Compliance Guidance No 33* for Release Criteria and Waste Disposal to complete the implementation of 10 CFR 850

3 REQUIREMENTS DOCUMENTS

The contractual documents that form the bases for the requirements of this Chapter are 10 CFR 850, *Chronic Beryllium Disease Prevention Program*, and Department of Energy (DOE) Order 440 1A, *Worker Protection Management for DOE Contractor Employees*

4 RESPONSIBILITIES

4 1 BERYLLIUM STEERING COMMITTEE

The Beryllium Steering Committee (BSC), chaired by a representative of the Kaiser-Hill Occupational Safety and Industrial Hygiene (K-H OS&IH) Department and made up of representatives from the Projects/subcontractors, Kaiser-Hill Risk Manager, the steelworkers union, DOE, RFFO, employees and Occupational Medicine Department, meets routinely It is the responsibility of the Beryllium Steering Committee to

- Develop performance feedback measures, annual exposure goals, and objectives and utilize measures to evaluate the DOE-approved CBDPP
- Address technical issues and recommend solutions and processes

4 2 EMPLOYEES

It is the responsibility of each Site employee to

- Follow all safety and health requirements of this Chapter as incorporated into specific work packages
- Attend necessary beryllium training, as instructed
- Report the presence of any previously unknown beryllium, beryllium article and/or beryllium-contaminated area to their supervisor

4.3 KAISER HILL CLOSURE PROJECT MANAGERS

It is the responsibility of Closure Project Managers to

- Implement the operational requirements in this Chapter in specific work control documents (e g IWCP) or with a Project specific Operations Order or Procedure
- Ensure the requirements in the work packages or Project specific Operations Order or Procedure are followed
- Provide work control procedures and note possible beryllium exposures for all operations in beryllium areas
- Ensure waste management practices are compliant with Environmental/Waste Compliance Guidance No 33
- Ensure adequate funding in Project baselines and planning to implement the requirements of this Chapter for all work activities subject to this Chapter
- Minimize the number of beryllium workers by controlling the addition of new Beryllium Workers and Beryllium Screened Workers through a written approval process (see Appendices 3 and 4) The number of new beryllium workers to be tracked by the TSR tracking numbers and related to Kaiser-Hill OS&IH on a monthly basis

4.4 KAISER-HILL ES&QP MANAGEMENT

It is the responsibility of ES&QP Kaiser-Hill management to ensure that the DOE-approved CBDPP is implemented at all levels throughout the Site It is the responsibility of Kaiser-Hill to

- Ensure work activity planning includes an assessment of the potential for beryllium exposure
- Ensure the content of the DOE-approved CBDPP is communicated to Projects, subcontractors, and employees
- Require Projects and subcontractors to implement the requirements of this Chapter for activities where the potential for beryllium exposure exists
- Include the number of Beryllium Workers in monthly reports provided to DOE, RFFO

- Perform assessments of Projects and subcontractors to evaluate the implementation of this Chapter

4 5 KAISER-HILL OCCUPATIONAL SAFETY AND INDUSTRIAL HYGIENE

It is the responsibility of the Kaiser-Hill Occupational Safety and Industrial Hygiene to

- Ensure the Site DOE-approved CBDPP meets all requirements of 10 CFR 850
- Record on the OSHA 200 log current employees who are diagnosed as having Chronic Beryllium Disease
- Review and update the CBDPP on a regular basis (at least annually)
- Give the Union timely notice of updates to the DOE-approved Chronic Beryllium Disease Prevention Program
- Create and guide the Site Beryllium Steering Committee
- Review the annual goals established for the Site by the Beryllium Steering Committee, and update as needed
- Propose to the Beryllium Steering Committee processes to minimize the overall number of beryllium workers
- Assist Projects and subcontractors in implementation of this Chapter
- Maintain records required in Section 6 of this Chapter
- Maintain technical oversight of the DOE-approved CBDPP and this Chapter

4.6 KAISER-HILL RISK MANAGER

It is the responsibility of the Kaiser-Hill Risk Manager to

- Prepare an Employer's First Report of Injury form and send this form to the applicable worker's compensation insurer or potential insurers once Kaiser-Hill has knowledge a worker who

1. Has been determined to be diagnosed as having Chronic Beryllium Disease or
2. Has been determined to be eligible for a maximum of/ or two years of permanent medical removal protection benefits

4.7 OCCUPATIONAL MEDICINE DEPARTMENT (OMD)

It is the responsibility of the Occupational Medicine Department to

- Provide the Site Occupational Medical Director (SOMD), as required in the Kaiser-Hill CBDPP
- Develop and implement procedures to meet the approved Kaiser-Hill CBDPP
- Maintain medical surveillance records and exposure monitoring records in the employee's medical file

4.8 KAISER-HILL CLOSURE PROJECTS RESPONSIBLE MANAGERS

All Projects are responsible for the implementation of this Chapter for work activities in all areas identified as containing beryllium articles, beryllium processing equipment or

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machining tools, Beryllium Controlled Areas, or Beryllium Regulated Areas It is the responsibility of Project responsible managers to

- Ensure applicable requirements of this Chapter are implemented for work activities with the potential for beryllium exposure
- Use work control procedures during the planning of all work packages to reduce potential beryllium hazards
- Develop standardized work packages for routine (minor maintenance) operations that occur within their projects and have potential beryllium exposures
- Ensure Beryllium Workers and Beryllium Screened Workers including qualified subcontractors on the list are used as appropriate

4.9 KAISER-HILL CLOSURE PROJECT/INDUSTRIAL HYGIENE AND SAFETY STAFF

It is the responsibility of the Closure Project industrial hygiene and safety staff to

- Review the work control packages for all beryllium operations
- Perform personal breathing zone sampling, as needed, for all beryllium work
- Maintain original records of all beryllium exposure monitoring conducted on subcontractor employees and forward an informational copy of the monitoring to Kaiser-Hill OS&IH and the Occupational Medical Department (OMD)
- Maintain entry logs for Beryllium Regulated and Beryllium Controlled Areas and submit copies to K-H OS&IH and Site Occupational Medicine monthly
- Complete all IH&S requirements placed on them by compliance with this program
- Provide Kaiser-Hill OS&IH with records required in Section 6 of this Chapter

4 10 KAISER-HILL BERYLLIUM SME

It is the responsibility of the Kaiser-Hill Beryllium SME to

- Maintain the Baseline Beryllium Inventory List
- Update this Chapter, as needed
- Lead and Chair the Beryllium Steering Committee
- Assure the annual submittal, as required in 10 CFR 850, of the formal Chronic Beryllium Disease Prevention Program to DOE/RFFO for approval or if substantive changes are made that require DOE/RFFO approval

4.11 KAISER-HILL TRAINING

It is the responsibility of the Kaiser-Hill Training to

- Develop and provide the beryllium training specified in Section 5 17 of this chapter
- Ensure the beryllium training program is implemented and updated as needed
- Provide the TSR listing of qualified Be Workers and Be Screened workers

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4.12 KAISER-HILL ENVIORNMENTAL SYSTEMS AND STEWARDSHIP

It is the responsibility of the Kaiser-Hill Environmental Systems and Stewardship group to

- Provide site wide requirements for the management of beryllium waste for off site shipping and disposal
- Ensure that appropriate Kaiser-Hill approved facilities are identified for the off site treatment and management of beryllium contaminated wastes
- Ensure Project implementation of *Environmental/ Waste Compliance Guidance No 33* though Management Assessments

5.0 REQUIREMENTS

5 1 GENERAL REQUIREMENTS

The DOE action level for airborne beryllium release is equal to the Rule action level of 0 2 µg/m^3 per 8 hour-time weighted average (TWA) as measured in the workers breathing zone, without credit for respiratory protection Beryllium work activities conducted in areas that are at or above the action level or are reasonably expected to be at or exceed the action level **SHALL** be classified as **Beryllium Regulated Areas** and the work activities conducted by trained and qualified Beryllium Workers Site activities **SHALL** adhere to the airborne beryllium action level, and **SHALL** be designed to reduce airborne exposures to as low as reasonably practicable (ALARP) based on engineering controls, administrative controls and personal protective equipment This hierarchy of controls shall be used for all work activities Projects **SHALL** develop and implement work practices to minimize the potential for airborne releases or particulate beryllium

The Site airborne beryllium control level is 0 1 µg/m^3 per 8 hour TWA as measured in the workers breathing zone All work activities that could result in exposure to airborne beryllium above the Site airborne control level or surface contamination above the Site surface contamination control level of (0 2 µg/100cm^2) **SHALL** be conducted in compliance with this Chapter

5 2 EXPOSURE MONITORING

5.2.1 GENERAL

All exposure monitoring **SHALL** be overseen and/or managed by a qualified person and the individuals assigned to these tasks have sufficient industrial hygiene knowledge and experience to properly perform the monitoring activities

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5 2 2 PERSONAL BREATHING ZONE AIR SAMPLES

During all initial work activities in posted Beryllium Regulated Areas, personal breathing zone air samples **SHALL** be collected on representative personnel associated with the initial work activity Results of initial breathing zone air samples will be used to dictate subsequent air samples and control measures Special attention will be given to beryllium work activities where there is reasonable expectation of beryllium contaminated dust release that could result in elevated short-term exposures

The Project IH&S **SHALL** ensure that within 10 working days after receipt of any personal breathing zone beryllium air monitoring results, the results are provided to the worker's supervisor to notify the worker in writing of the monitoring results The notification of monitoring results **SHALL** be made personally to all monitored worker(s) or mailed to the worker(s) if no longer in the facility or on plant site

The Project IH&S **SHALL** ensure that within one working day after receipt of any personal breathing zone air monitoring results that are at or above the action level of 0 2 $\mu g/m^3$ per 8 hour TWA, the supervisor of the affected worker(s) is notified and the supervisor personally notifies the affected worker(s) of the monitoring results The following additional actions are required

- The supervisor accompany the worker(s) to the Medical Department with notification of the elevated exposure to the Site Occupational Medical Director
- The Project IH&S notifies the K-H OS&IH Manager of the exposure
- Within two working days, the Project Operations Manager completes Appendix 2 of 1-D97-ADM-16 01, *Occurrence Reporting Process,* and provides a copy to the K-H OS&IH Manager
- The Kaiser-Hill OS&IH Manager **SHALL** notify the Kaiser-Hill Risk Manager within two days after receipt of Appendix 2 of the Occurrence Report

5 3 POSTING AND CONTROLS

5 3.1 POSTING BERYLLIUM REGULATED AREAS

5.3.1 Where airborne beryllium concentrations have been measured to be at or above the DOE action Level of 0 2 $\mu g/m^3$ per 8 hour TWA or where the work activities can reasonably be expected to meet or exceed the action level for airborne beryllium, the Project **SHALL** establish a posted **Beryllium Regulated Area.** The **DANGER** posting sign for a Beryllium Regulated Area is shown in Appendix 7 of this Chapter

The following controls **SHALL** be in effect for Beryllium Regulated Areas

- Clearly demarcate the Beryllium Regulated Area from the rest of the workplace in a manner that adequately alerts workers
- Access is limited to Beryllium Workers except during an emergency

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- Access is controlled through the used of a Step-Off Pad to and from the Beryllium Regulated Area to control the spread of contamination
- A log, Appendix 5 of this Chapter, **SHALL** be used to control access and record entry and exit access
- Engineered airborne beryllium exposure reduction and minimization practices, as appropriate, **SHALL** be put in place
- Respiratory protection and protective clothing **SHALL** be required
- Be contaminated waste generated during work activities **SHALL** be managed per *Environmental /Waste Compliance Guidance No 33*

5 3 2 DE-POSTING A BERYLLIUM REGULATED AREA

A Beryllium Regulated Area may be de-posted when airborne beryllium sample results indicate that the airborne beryllium levels are below 0 2 µg/m^3 per 8 hour TWA If any beryllium surface samples are at or above 0 2 µg/100cm^2 the area **SHALL** be posted as a **Beryllium Controlled Area.**

5.3 3 POSTING BERYLLIUM CONTROLLED AREA

The Project **SHALL** post areas that have surface beryllium contamination levels that are greater than or equal to 0 2 µg/100cm^2 and/or have the potential for airborne that is greater or equal to 0 1 µg/m^3 per 8 hour TWA but less than 0 2µg/m^3 per 8 hour TWA as a **Beryllium Controlled Area.** The **CAUTION** sign for a Beryllium Controlled Area is shown in Appendix 7 of this Chapter

The following controls **SHALL** be in effect for Beryllium Controlled Areas

- The Project qualified industrial hygienist is responsible for supporting line management in evaluating area designation, the work activities to be conducted and evaluating area designation, providing input to engineering and administrative controls, and establishing personal protective equipment in a Beryllium Controlled Area
- Project IH&S **SHALL** review planned Beryllium Work activities prior to the start of work
- Personnel involved in work activities in a Beryllium Controlled Area **SHALL** be as a minimum Beryllium Screened Workers except during an emergency
- Clearly demarcate the Beryllium Controlled Area from the rest of the workplace in a manner that adequately alerts workers
- A log, Appendix 6 of this Chapter, **SHALL** be used to control access and record entry and exit access

- Airborne beryllium monitoring will be conducted as defined in the work package Personal breathing zone air monitors **SHALL** be worn by a representative number of the workers

- Respirators and personal protective equipment requirements, as appropriate, are to be defined in the work package Respirators are mandatory when airborne potential is 0 1µg/m^3 or greater

- Beryllium contaminated waste generated during work activities **SHALL** be managed per *Environmental/ Waste Compliance Guidance No 33*

- A worker **SHALL** be allowed the use of respiratory protection at their discretion even if the work control package does not specify respiratory protection

5.3 4 DEPOSTING A BERYLLIUM CONTROLLED AREA

A Beryllium Controlled Area may be de-posted when airborne beryllium sample results indicate the airborne levels are below 0 1µg/m^3 per 8 hour TWA and the beryllium surface samples are below 0 2µg/100cm^2

5 3.5 POTENTIALLY CONTAMINATED EQUIPMENT OR SYSTEMS AND HISTORICAL AREAS

5 3.5 1 POTENTIALLY CONTAMINATED EQUIPMENT OR SYSTEMS

Some facilities contain equipment or systems that may have internal beryllium contamination where there are no current plans to perform intrusive work The Project **SHALL** post a **NOTICE** sign at the entrance to the facility or area The facility **NOTICE** sign for Contaminated Equipment or Systems is shown in Appendix 7 of this Chapter When intrusive work is planned, the area may require posting as a Beryllium Controlled or Beryllium Regulated Area based on further characterization

5.3.5.2 HISTORICAL AREAS

The presence or absence of beryllium across the plant-site has been determined by applying process knowledge, worker input, professional judgment, and collecting air, surface and bulk samples Areas found to have past or present beryllium activities and/or contamination can be found on the Safety and Industrial Hygiene Homepage, Chronic Beryllium Disease Prevention Program Section, by clicking on the "Listing" This list is maintained by K-H OS&IH and is up dated as new information becomes available

Lists of current beryllium contaminated areas and systems can be found on the intranet at http //rfetshp/S&IH/Beryllium/berylliu htm

The Industrial Hygiene Information System (IHIS) contains data on sampling conducted since 1999 Project Industrial Hygienists are responsible for updating/accessing the system and generating reports on recent data as needed

Prior to performing activities in historical areas and intrusive work on potentially contaminated systems, the Historical list, the intranet lists and the IHIS should be reviewed during the work package preparation to help determine the potential beryllium hazard for the activities to performed

5.3.5 3 CONTROLS IN NOTICE AREAS

There are no special beryllium requirements for personnel entering or performing work in facilities that contain equipment or systems with internal beryllium contamination or historical areas However, work activities in historical areas and intrusive work on potentially contaminated systems must be evaluated to ensure hazards and controls are identified

Table 1 summarizes the basis requirements for establishing and posting beryllium work areas and worker qualifications.

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Table 1 Summary of Requirements

CLASSIFICATION	CRITERIA	POSTING	AUTHORIZATION/ QUALIFICATION	CONTROLS
Beryllium Regulated Area	Airborne or the potential for airborne beryllium contamination at or above 0 2 µg/m^3 as an 8 Hr TWA	**DANGER** **BERYLLIUM REGULATED AREA** **BERYLLIUM CAN CAUSE LUNG DAMAGE** **CANCER HAZARD** **AUTHORIZED PERSONNEL ONLY**	Beryllium Workers	Work Control Document (e g IWCP), including hazard controls Respiratory protection and PPE Personal air monitor Be entry log
Beryllium Controlled Area	Surface contamination at or above 0 2 µg/100 cm^2 and/or reasonably expected to have airborne greater than or equal to 0 1µg/m^3 but less than 0 2 µg/m^3 as an 8 Hr TWA	**CAUTION** **BERYLLIUM CONTROLLED AREA** **CONTAMINATED WITH BERYLLIUM** **BERYLLIUM CAN CAUSE LUNG DAMAGE** **CANCER HAZARD** **AUTHORIZED PERSONNEL ONLY**	Beryllium Screened Workers	Work Control Document (e g IWCP), including hazard controls Respiratory protection and/or PPE may be required Respirator protection required if airborne potential greater than or equal to 0 1 ug/m^3 Be entry log
Potential Beryllium Contaminated Equipment and/or Systems	No external Be contamination measured	**NOTICE** **POTENTIAL BERYLLIUM CONTAMINATED EQUIPMENT &/OR SYSTEMS** **SYSTEMS OR EQUIPMENT IN THIS BUILDING MAY CONTAIN BERYLLIUM** **SAFETY ASSESSMENT REQUIRED PRIOR TO INTRUSIVE WORK ACTIVITIES**	Activity Dependent No requirements for non-intrusive work	Activity dependent

5.4 EXPOSURE REDUCTION CONTROLS

Exposure reduction controls of beryllium activities **SHALL** be implemented and maintained These controls **SHALL**, as a minimum, include

- Control of the numbers of workers involved to the lowest number necessary to safely perform the work
- Reduction of the potential exposures through the use of
  - Engineering Controls,
  - Safe work practices, and
  - Personal Protective Equipment
- Use of Job Hazard Analyses (JHAs) to identify all potential sources of beryllium and identify methods of reducing potential beryllium exposure
- Conformance with the work control document

5 5 MEDICAL SURVEILLANCE PROGRAM

All beryllium-associated workers **SHALL** be encouraged to participate in the Site Beryllium Medical Surveillance Program to facilitate early detection of new cases of beryllium sensitization and/or chronic beryllium disease (CBD) by annual testing of Beryllium Workers (required), triennial testing of Beryllium Screened Workers (required), and triennial testing of the remaining, volunteering beryllium-associated workers

Details of the Beryllium Surveillance Program are contained in *Chapter 21* of the Occupational Medicine Department Program Procedures (PRO-874-OMD01)

5.6 BASELINE BERYLLIUM INVENTORY

Kaiser-Hill **SHALL** maintain the baseline inventory of locations of historically probable and potential beryllium contamination The inventory is maintained on the RFETS Intranet for ease of access to management, planners, project/subcontractor S&IH, and other RFETS personnel The inventory is found at http //rfetshp/S&IH/berylliu htm

This information **SHALL** be used by management, planners, and industrial hygiene during work control document (e g IWCP) development to identify activities with the potential to generate airborne beryllium particulate and in pre-planning for hazard control and mitigation in the design phase of each such activity The project industrial hygiene representative or the Kaiser-Hill OS&IH Beryllium SME can be contacted for more specific information

Additional information and/or corrections to the inventory **SHALL** be submitted in writing to the Kaiser-Hill OS&IH Beryllium SME

5.7 BERYLLIUM HAZARD ASSESSMENT

Where the presence of beryllium is known or suspected, the Project/Subcontractor **SHALL** conduct a beryllium hazard assessment as part of the Job Hazard Analysis section of the IWCP work package The JHA should consider existing conditions, beryllium sample data and the exposure potential of planned activities The Project/Subcontractor **may** use the optional Beryllium Work Form shown in Appendix 2 of this Chapter to supplement the JHA in the work control document

The hazard assessment **SHALL** be reviewed by a qualified person and that the qualified person ensures that the individuals assigned to the hazard analysis have sufficient knowledge and experience to perform the assessment

5.8 SAMPLING

Beryllium sampling **SHALL** be managed and performed by individuals having sufficient industrial hygiene knowledge and experience to perform these activities properly

5.8.1 INITIAL SAMPLING

Initial sampling **SHALL** be performed in areas that may have airborne beryllium or beryllium surface contamination, as determined by the baseline beryllium inventory and beryllium hazard assessment Sampling strategies **SHALL** be applied to obtain a sufficient number of sample results to adequately characterize airborne or surface contamination, before reducing or terminating sampling Breathing zone sampling **SHALL** be used to determine workers' 8-hour TWA exposure levels

5.8.2 PERIODIC SAMPLING

Periodic sampling of areas where airborne concentrations of beryllium are at or above the RFETS Control Level **SHALL** be conducted The sampling **SHALL** be conducted in a manner and at a frequency necessary to represent potential workers' exposure

5.8.3 QUARTERLY SAMPLING

Where beryllium may be present in Project facilities, routine surface sampling **SHALL** be conducted, at least quarterly, to determine housekeeping conditions

Surfaces above the RFETS Control Level of 0 2µg/100cm^2 **SHALL** be posted or labeled, as appropriate

Surfaces in Project facilities **SHALL** be maintained below a removable contamination level of 3µg/100cm^2 during non-operational periods, except on surfaces of the interior of installed closed systems such as enclosures, glove boxes, chambers, or ventilation systems or "sealed" or posted under active D&D rooms

Quarterly sampling results **SHALL** be reported by the Kaiser-Hill Project/Subcontractor S&IH to the Kaiser-Hill Beryllium SME no later than the end of the month following the end of the quarter on a fiscal year basis (*i e*, January 31st, April 30th, July 31st, and October 31st)

The Project/Subcontractor S&IH is responsible for entering the details of all sampling in the IHIS database

5.8 4 SAMPLING IN NON-BERYLLIUM CONTAMINATED FACILITIES AREAS

Random quarterly samples, as determined by the Project IS&H **SHALL** be collected in selected non-beryllium contaminated facility areas to document a negative assessment exposure Sampling **SHALL** include break rooms, cafeterias, and/ or locker rooms when these are present in the facility

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5 8 5 ADDITIONAL SAMPLING

Additional sampling **SHALL** be performed if activities, operations, maintenance or procedures change, or when there is reason to suspect such a change has occurred

5.8.6 ACCURACY OF MONITORING

Unless activities or other limiting circumstances preclude their use, NIOSH or OSHA sampling methods **SHALL** be used for breathing zone samples

5.8.7 ANALYSIS

Breathing zone samples **SHALL** be analyzed in a laboratory accredited for metals by the American Industrial Hygiene Association (AIHA) or a laboratory that demonstrates quality assurance for metals analysis that is equivalent to AIHA accreditation

5.8 8 SAMPLE REPORTING AND DISPLAY

The Project IS&H **SHALL** report all sample data to the K-H IHIS database In addition, the Projects **SHALL** maintain a facility map that shows the location of beryllium contaminated areas and rooms that is available for the workers and work planners

5.9 HYGIENE FACILITIES AND PRACTICES

5.9.1 GENERAL

In Beryllium Regulated and Beryllium Controlled Areas

- Food and beverages **SHALL** not be allowed
- Tobacco products **SHALL** not be used
- Cosmetics **SHALL** not be applied
- Beryllium Workers **SHALL** remove protective clothing upon exiting

5.9.2 CHANGE ROOMS OR AREAS

Clean change rooms or areas **SHALL** be provided for and used by Beryllium Workers and Beryllium Screened Workers who work in Beryllium Posted Areas

- Facilities free of beryllium **SHALL** be provided for Beryllium Workers and Beryllium Screened Workers to change into, and store, personal clothing, and clean protective clothing and equipment to prevent cross-contamination, and,
- The areas that are used to remove beryllium-contaminated clothing and protective equipment **SHALL** be maintained under negative pressure or located so as to minimize dispersion of beryllium into clean areas

5.9.3 SHOWERS AND HANDWASHING FACILITIES

- Hand washing and shower facilities **SHALL** be provided for Beryllium Workers and Beryllium Screened Workers who work in Beryllium Regulated and Beryllium Controlled Areas

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- Beryllium Workers who work in Beryllium Regulated Areas **SHALL** shower at the end of the work shift before leaving the Site Beryllium Workers and Beryllium Screened Workers who work in Beryllium Controlled Areas **should** shower at the end of the work shift before leaving the Site

5.9.4 LUNCHROOM FACILITIES

- Lunchroom facilities **SHALL** be provided and **SHALL** be readily accessible to Beryllium Workers and Beryllium Screened Workers Tables for eating **SHALL** be free of beryllium, and workers in a lunchroom facility **SHALL NOT** be exposed at any time to beryllium at or above the RFETS Control Level
- Beryllium Workers or Beryllium Screened Workers **SHALL NOT** enter lunchroom facilities with beryllium protective work clothing or beryllium-contaminated equipment

5.9 5 FACILITY SANITATION

Change rooms or areas, shower and hand washing facilities, and lunchroom facilities **SHALL** comply with 29 CFR 1910 141, *Sanitation*

5.10 RESPIRATORY PROTECTION

Respiratory protection **SHALL** comply with the requirements of 29 CFR 1910 134, Respiratory Protection, see OS&IH PM Chapter 31, *Respiratory Protection Practices*

Respirators **SHALL** be provided to and used by all workers who

- Are exposed to an airborne concentration of beryllium that is equal to or greater than 0 1µg/m^3 per 8 hour TWA or
- Are performing tasks for which work activities can reasonably be expected to meet or exceed the 0 1µg/m^3 or
- Request the use of a respirator for protection against airborne beryllium, regardless of measured exposure levels

5.11 PROTECTIVE CLOTHING AND EQUIPMENT

5 11 1 PROTECTIVE CLOTHING

Beryllium Workers and Beryllium Screened Workers **SHALL** be provided and **SHALL** use appropriate protective clothing (see OS&IH PM Chapter 35, *Safe Work Apparel)* and equipment, where dispersible forms of beryllium may contact worker's skin, enter openings in workers' skin, or contact workers' eyes, including where

- Exposure sampling has established that airborne concentrations of beryllium are at or above 0 1µg/m^3 and/or
- Surface contamination levels have been measured (as housekeeping confirmation or pre-work testing) or are presumed to be above 0 2 µg/100cm^2
- Any Beryllium Worker or Screened Worker may request the use of protective clothing and equipment for protection against airborne beryllium or surface contamination, regardless of measured exposure levels and work package PPE requirements

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5.11.2 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment **SHALL** comply with the requirements of 29 CFR 1910 132, *Personal Protective Equipment General Requirements*, (see OS&IH PM Chapter 29, *Eye and Face Protection*, OS&IH PM Chapter 30, *Foot Protection*, and OS&IH PM Chapter 34, *Head Protection*

PPE determined to be appropriate during work planning and recorded in the IWCP work control document **SHALL** be used

Procedures for donning, doffing, handling, and storing protective clothing and equipment to prevent or reduce dispersion of particulate contamination **SHALL** be used

Beryllium Workers **SHALL** exchange their personal clothing for full-body protective clothing and footwear before they begin work in Beryllium Regulated or Beryllium Controlled Areas

Beryllium Screened Workers **SHALL** exchange their personal clothing for full-body protective clothing and footwear before they begin work in Beryllium Controlled Areas

Protective clothing and equipment **SHALL** be cleaned, laundered, repaired, or replaced to maintain effectiveness

Contaminated clothing and equipment **SHALL** be handled during doffing, bagging for the laundry, opening at the laundry, and in any other handling situation such that dispersion of dust is prevented or reduced to the lowest practicable level

Removal of beryllium from protective clothing and equipment by blowing, shaking, or other means that may disperse beryllium into the air **SHALL NOT** be allowed

Beryllium-contaminated protective clothing and equipment removed for laundering, cleaning, maintenance, or disposal **SHALL** be placed in containers that prevent the dispersion of beryllium dust and are labeled in accordance with Appendix 8 of this Chapter Containers **SHALL NOT** be compacted unless by creating a vacuum with an HEPA-filtered vacuum

Kaiser-Hill OS&IH **SHALL** approve laundry facilities for beryllium-contaminated respiratory protection, protective clothing or equipment Contact the Kaiser-Hill OS&IH Beryllium SME for approved laundry facilities

A sample of a Posting Sign for required Personnel Protective Equipment is shown in Appendix 7 PPE postings are at the option of the Project and the requirements in the specific work package

5.12 HOUSEKEEPING

5.12.1 SURFACE CLEANING

Floors and other surfaces where beryllium is present **SHALL** be cleaned using a wet method, HEPA-filtered vacuuming or other cleaning method that avoids the production of airborne dust Compressed air or dry methods **SHALL NOT** be used for such cleaning

The filters in HEPA-filtered vacuums used for beryllium **SHALL** be changed as often as needed to maintain capture efficiency The vacuums **SHALL** be labeled as beryllium contaminated and controlled as such

5.13 BERYLLIUM CONTAMINATED RELEASE CRITERIA

5.13.1 GENERAL

All beryllium-contaminated equipment and other items **SHALL** be cleaned to the lowest contamination level practicable and labeled, and handled to prevent dust release

Equipment or other items that are beryllium-contaminated **SHALL NOT** be released to the public until and unless wipe samples validate that contamination levels are <0 2 µg/100 cm^2

The following release criteria **SHALL**, as a minimum, be followed for equipment release

To Allow	Release Criteria
Release to public	All surfaces <0 2 µg/100 cm^2
Release to other beryllium facilities where equipment is not intended for beryllium use	All accessible surfaces <0 2 µg/100 cm^2
Release to other beryllium facilities where equipment is intended for beryllium use	All outer surfaces <3 µg/100 cm^2
Release to disposal site	Compliance with disposal site permit (and all other) requirements See *Environmental/ Waste Compliance Guidance No 33* for detail requirements

Prior to releasing beryllium contaminated equipment or other items to the general public or for use in a non-beryllium area in a DOE facility the Project **SHALL** ensure that

- The equipment or item is labeled according to appendix 8
- The release is conditioned on the recipients written commitment to implement controls that will prevent foreseeable beryllium exposure, considering the nature of the equipment or item and its future use and the nature of the beryllium contamination

Prior to releasing beryllium contaminated equipment or items to another facility performing work with beryllium, the Project **SHALL** ensure that

- The equipment or item is labeled in accordance with Appendix 8

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- The equipment or item is enclosed or placed in sealed, impermeable bags or containers to prevent the release of beryllium dust during handling and transportation

5 14 WASTE DISPOSAL

Beryllium-containing waste and the disposal of beryllium-contaminated equipment and other items as waste **SHALL** be in accordance with 1-PRO-079-WGI-001, *Waste Characterization, Generation, and Packaging* Guidance regarding the labeling, packaging, and management options are found in *Environmental / Waste Compliance Guidance No 33*

5 15 BERYLLIUM EMERGENCIES

The current Kaiser-Hill *Emergency Preparedness Program* is in accordance *with* DOE Order 151 1A *and* 29 CFR 1910 120, and addresses the limits for uncontrolled release of chemicals and materials, including beryllium Sections of the *Site Emergency Plan* (EPAN) and the implementing procedures that address these limits are Site EPLAN, Section 1 4 2 (Hazards Survey and Hazards Assessments, Section 7 2 (Protective Action Criteria), and Procedure PRO-T56-04-00, *Emergency Classification and Protective Actions,* Appendix 1 (Facility Emergency Action Levels, Appendix 2 (Site-wide Emergency Classification Criteria), and Appendix 4 (Chemical-Specific Emergency Response Planning Guideline Reference)

There are no restrictions for emergency personnel responding to an emergency in a Beryllium Regulated or Controlled Area

Emergency personnel exposed to airborne beryllium contamination above the Site Action Level **SHALL** be offered a medical evaluation upon receipt of airborne sampling results

5 16 MEDICAL SURVEILLANCE

5 16.1 GENERAL

The Occupational Medicine Department Director is the designated Beryllium Disease Prevention Site Occupational Medical Director (SOMD), per 10 CFR 850

The Beryllium Medical Surveillance Program is contained in Chapter 21 of the *Occupational Medicine Program Procedures* (PRO-874-OMD01)

Employees who have been determined to be sensitized to beryllium or diagnosed **SHALL** be offered multiple physician review as part of the beryllium medical surveillance program (see *Chapter 21* of the Occupational Medicine Department Program Procedures (PRO-874-OMD01)

The affected employee **SHALL** receive a written medical opinion after each medical evaluation performed for beryllium It **SHALL** contain the results of all medical tests or procedures, an explanation of any abnormal findings, and any recommendation that the worker be referred for additional testing for evidence of CBD, within 10 working days after the SOMD's receipt of the results of the medical tests or procedures

5 16.2 MEDICAL RESTRICTION/REMOVAL

5 16.2 1 Determining Medical Restriction/Removal

Individuals who are sensitized to beryllium or having Chronic Beryllium Disease or for other medical conditions as determined by the Site Occupational Medical Director **SHALL** not be qualified as Beryllium Worker or Beryllium Screened Workers In addition, these individuals **SHALL** be restricted from entering Beryllium Controlled or Beryllium Regulated areas The individuals may be reassigned to appropriate non-beryllium Project work activities The individuals will be encouraged to remain either in the current worker or former worker Beryllium surveillance program for life

See *Chapter 21* of the Occupational Medicine Program Procedures, PRO-874-OMD01

5 16 2 2 Medical Restriction/Removal Protection Benefits

If a beryllium-associated worker has been permanently removed from beryllium exposure, Kaiser-Hill **SHALL** provide the beryllium-associated worker

- The opportunity to transfer to another position which is available, or later becomes available, for which the beryllium-associated worker is qualified (or for which the worker can be trained in a short period) and where beryllium exposures are as low as possible, but in no event at or above the action level, or
- If the beryllium-associated worker cannot be transferred to a comparable job where beryllium exposures are below the action level, a maximum of 2 years of permanent medical removal protection benefits **SHALL** be provided
- If required by this section to provide medical removal protection benefits, Kaiser-Hill shall maintain the removed worker's total normal earnings, seniority and other worker rights and benefits, as though the worker had not been removed
- If a removed beryllium-associated worker files a claim for workers' compensation payments for a beryllium-related disability, then Kaiser-Hill shall continue to provide medical removal protection benefits pending disposition of the claim Kaiser-Hill shall receive no credit for the workers' compensation payments received by the worker for treatment related expenses

Kaiser-Hill's obligation to provide medical removal protection benefits to a removed beryllium-associated worker is reduced to the extent that the worker receives compensation for earnings lost during the period of removal either from a publicly- or employer-funded compensation program, or from employment with another employer made possible by virtue of the worker's removal

The requirement that Kaiser-Hill provide medical removal protection benefits is not intended to expand upon, restrict, or change any rights to a specific job classification or position under the terms of an applicable collective bargaining agreement

5 16 3 MEDICAL CONSENT

Each beryllium-associated worker **SHALL** be provided with a summary of the medical surveillance program at least one week before the first medical evaluation or procedure or at any time requested by the worker This summary **SHALL** include

- The type of data that will be collected in the medical surveillance program,
- How the data will be collected and maintained,
- The purpose for which the data will be used, and
- A description of how confidential data will be protected

Each beryllium-associated worker **SHALL** sign the informed consent form, provided in *Chapter 21* of Occupational Medical Department Program Procedures (PRO-874-OMD01), before beryllium surveillance medical evaluations or tests will be performed

5.17 TRAINING

5.17 1 GENERAL TRAINING

A beryllium training program **SHALL** be developed and implemented to ensure participation for

- Individuals who work at or visit RFETS,
- Beryllium-associated workers (other than Beryllium and Beryllium Screened workers), and
- Beryllium and Beryllium Screened Workers

5.17.2 INDIVIDUAL AND BERYLLIUM ASSOCIATED WORKER TRAINING

The training provided for general Site workers and visitors, is in accordance with 29 CFR 1910 1200, *Hazard Communication* and includes general awareness about beryllium hazards and controls

5 17 3 BERYLLIUM AND BERYLLIUM SCREENED WORKER TRAINING

The training provided for Beryllium and Beryllium Screened Workers, **SHALL** be in accordance with 29 CFR 1910 1200, Hazard Communication, as provided to all Site employees and additionally include

- The contents of the current K-H CBDPP, and
- The potential health risks to beryllium worker family members and others who may come in contact with beryllium on beryllium workers or on beryllium workers' personal clothing or on other personal items as the result of a beryllium control failure at the site, and
- A classroom training session that allows attendees to ask questions A representative from the OS&IH Department and from the Occupational Medicine Department may be present or consulted, as need, to provide answers to questions

Kaiser-Hill **SHALL** provide the training required by this section before or at a time of initial assignment A refresher course **SHALL** be provided every two years thereafter Kaiser-Hill Training Department maintains documentation of training

A separate hands-on training session **SHALL** be provided that addresses donning and doffing procedures, safe work practices, and dust suppression methods, such as wetting, fixative use, HEPA vacuuming, ventilation systems, and other controls as developed per the Training Users Manual (TUM)

Kaiser-Hill **SHALL** provide retraining or appropriate one-on-one briefing when the employer has reason to believe that a beryllium worker lacks the proficiency, knowledge, or understanding needed to work safety with beryllium

Kaiser-Hill **SHALL** provide retaining when new beryllium hazards result from a change to operations, procedures, or beryllium controls which the beryllium worker was not previously trained

Beryllium and Beryllium Screened Workers **SHALL** attend the appropriate training

5 18 COUNSELING

Beryllium-associated workers who are diagnosed by the SOMD as beryllium sensitized or as having CBD **SHALL** have access to a counseling program that includes

- The medical surveillance program provisions and procedures,
- Medical treatment options,
- Medical, psychological, and career counseling,
- Medical benefits,
- Administrative procedures and workers rights under applicable Workers' Compensation laws and regulations,
- Work practice procedures limiting beryllium-associated worker exposure to beryllium, and
- The risk of continued beryllium exposure after sensitization

5.19 WARNING SIGNS AND LABELS

5.19.1 WARNING SIGNS (SEE **APPENDIX 7** FOR EXAMPLES)

5.19.2 WARNING LABEL (SEE **APPENDIX 8** FOR EXAMPLE)

5.20 USE OF INFORMATION

Records specified by 10 CFR 850 and this Chapter **SHALL** be maintained in current electronic systems, which maintain necessary confidentiality

K-H OS&IH in coordination with the Occupational Medicine Department **SHALL** transmit all records required by 10 CFR 850, in a format that protects the confidentiality of individuals, to the DOE Assistant Secretary for Environment, Safety and Health semi-annually, or on request

5 21 PERFORMANCE FEEDBACK

Kaiser-Hill OS&IH **SHALL** conduct annual analyses and assessments of monitoring activities, hazards, medical surveillance, exposure reduction and minimization, and occurrence reporting data

The Beryllium Steering Committee (BSC) **SHALL** be provided a monthly report highlighting quantifiable program status items, such as the following

- Number of personal breathing zone samples
  - below the Limit of Reportability (LOR) where the LOR for the sample is <0 1µg/m^3
  - below the Site Control Level of 0 1µg/m^3 per 8 hr TWA Airborne
  - at the Site Control Level and below the DOE airborne Action Level of 0 2µg/m^3 /
  - at the DOE airborne Action Level and below 2 0µg/m^3 (the OSHA Permissible Exposure Limit [PEL])
  - above the OSHA PEL
- Number of surface samples below 0 2µg/ 100 cm^2, between 0 2 µg/ 100 cm^2 and 3µg/ 100 cm^2 and equal to or above 3µg/ 100 cm^2
- Number of new and current Beryllium Workers and Beryllium Screened Workers that month
- Number of Be-LPT confirmed sensitization's reported
- Number of CBD diagnoses reported

Additional items that **SHALL** be reported to the BSC include the results of periodic analyses and assessments of the K-H Chronic Beryllium Disease Prevention Program

6 RECORDS

Accurate records of all beryllium inventory information, beryllium hazard assessments, exposure measurements, exposure controls, and medical surveillance **SHALL** be maintained Records **SHALL** be created, identified, generated, maintained, and dispositioned in accordance with the requirements of *Records Management Guidance for Records Sources*, 1-V41-RM-001 Rev 1

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RECORDS AND RESPONSIBLE ORGANIZATIONS

RECORD TYPE	RESPONSIBLE ORGANIZATION
1 Beryllium Inventory (Be Sample Database)	1 K-H OS&IH For Central Data Bases K-H Closure Projects for Specific Facilities
2 Beryllium Hazard Assessments	2 K-H Closure Projects Included in IWCP Specific Work Packages
3 Exposure Measurements	3 Originals in K-H Closure Projects Copies to K-H OS&IH
4 Exposure Controls	4 K-H Closure Projects Included in IWCP Work Packages
5 Medical Surveillance	5 Occupational Medical Department
6 Training (Qualification of Be & Be Screened Workers)	6 Training in TSR
7 Performance Feedback Data (Section 5 20)	7 K-H OS&IH

Records Processing Matrix

Record Identification	Record Type Determination	Protection / Storage Methods	Processing Instructions
See the listing of record types in the above table	See the listing of record types and responsible organizations in the above table	Responsible Manager **SHALL** implement a reasonable level of protection to prevent loss and/or degradation Responsible Manager should define the specific protection and storage methods for the document(s), as defined in 1-V41-RM-001 It is recommended that the Responsible Manager work with the Site Records Management organization to assure reasonable record controls are being implemented	When records become inactive (as defined in 1-V41-RM-001), transfer to Site Records Management in accordance with 1-V41-RM-001

7. REFERENCES

DOE Order 440 1A, *Worker Protection Management for DOE Contractor Employees*
10 CFR 850, *Chronic Beryllium Disease Prevention Program*
29 CFR 1910, Subpart I, *Personal Protective Equipment*
29 CFR 1910 and 1926, Subpart Z, *Toxic and Hazardous Substances*
29 CFR 1910 1020, *Access to Employees Exposure and Medical Records*
29 CFR 1910 1200, *Hazard Communication*
29 CFR 1910 1450, *Occupational Exposure to Hazardous Chemicals in Laboratories*
ACGIH, *Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment*
Kaiser –Hill Standing Order #74, Revision 1, Beryllium Program Requirements,
Kaiser-Hill *Environmental/ Waste Compliance Guidance No 33*
Chapter 21 of the *Occupational Medicine Program Procedures,* PRO-874-OMD01

8 APPENDICES

Appendix 1, Definitions and Acronyms
Appendix 2, Optional Beryllium Work Form
Appendix 3, Beryllium Worker Authorization Processes
Appendix 4, Beryllium Screened Worker Authorization Process
Appendix 5, Beryllium Regulated Area Sign In Log Form
Appendix 6, Beryllium Controlled Area Sign In Log Form
Appendix 7, Signs
Appendix 8, Labels

APPENDIX 1
DEFINITIONS AND ACRONYMS
(Page 1 of 4)

1.1 SHALL, Should and May Statements

The word **SHALL** identifies those mandatory requirements or actions which must be followed, unless a change to this Manual chapter is approved to allow use of an alternate approach or method The word **should** indicates a recommendation that is based on standards and good safety and business practices The word **may** indicates when permission is granted, but the action is neither a recommendation or a requirement **May** statements often provide a suggested or possible course of action when a consistent methodology is not required For emphasis, these terms appear in boldface throughout this Chapter

1 2 Definitions

Authorized Person Any person required by work duties to be in a Beryllium Regulated Area or a Beryllium Controlled Area

Beryllium. Elemental beryllium and any insoluble beryllium compound or alloy containing 0 1 percent beryllium or greater that may be released as an airborne particulate

Beryllium activity An activity that can expose workers to airborne beryllium, including but not limited to design, construction, operation, maintenance, or decommissioning, and which may involve one or a combination of facilities and operations

Beryllium article A manufactured item that is formed to a specific shape or design during manufacture, that has end-use functions that depend in whole or in part on its shape or design during end use, and that does not release beryllium or otherwise result in exposure to airborne concentrations of beryllium under normal conditions of use

Beryllium-associated worker A current Site worker who is or was exposed or potentially exposed to airborne concentrations of beryllium at the Site, including

- A Beryllium Worker or Beryllium Screened Worker,
- A current worker whose work history shows that the worker may have been exposed to airborne concentrations of beryllium at a DOE facility,
- A current worker who exhibits signs or symptoms of beryllium exposure, and
- A current worker who is receiving medical removal protection benefits

Beryllium Controlled Area. An area in which the beryllium airborne concentration or surface contamination exceeds, or can reasonably be expected to exceed, the RFETS Control Level

Beryllium emergency. Any occurrence such as, but not limited to, equipment failure, container rupture, or failure of control equipment or operations that results in an unexpected and significant release of beryllium at a DOE facility

Beryllium-induced lymphocyte proliferation test (Be-LPT). An in vitro measure of the beryllium antigen-specific, cell-mediated immune response

Beryllium Regulated Area An area in which the airborne concentration of beryllium exceeds, or can reasonably be expected to exceed, the DOE Action Level

APPENDIX 1
DEFINITIONS AND ACRONYMS
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Beryllium Subject Matter Expert (Beryllium SME). The Kaiser-Hill Company, L L C , Safety and Industrial Hygiene staff member who is the qualified individual (e g , ABIH Certified Industrial Hygienist) functioning as the lead for 10 CFR 850 compliance

Beryllium Screened Worker. A current worker who is qualified by training and medical surveillance to participate in beryllium activities in a Beryllium Controlled Area

Beryllium Worker. A current worker who is qualified by training and medical surveillance to participate in beryllium activities in Beryllium Regulated Areas and/or Beryllium Controlled Areas

Breathing zone. A hemisphere forward of the shoulders, centered on the mouth and nose, with a radius of 6 to 9 inches

DOE. The U S Department of Energy

DOE Action Level. The level of airborne concentration of beryllium established pursuant to 10 CFR 850 that, if met or exceeded, requires the implementation of worker protection provisions by the Rule

DOE contractor. Any entity under contract with DOE (or its subcontractor) that has responsibility for performing beryllium activities at DOE facilities

Head of DOE Field Element. An individual who is the manager or head of the DOE operations office or field office, or any official to whom the head of DOE Field Element (RFFO) delegates his or her functions under 10 CFR 850 and/or this Chapter

Hierarchy of controls The order in which industrial hygiene controls are implemented to protect workers Controls **should** be implemented in the following order

(1) Substitution of materials and engineering controls
(2) Administrative and work practice controls
(3) Personal protective equipment use

High-efficiency particulate air (HEPA) filter. A filter capable of trapping and retaining at least 99 97 percent of 0 3 micrometer mono-dispersed particles

Immune response. The series of cellular events by which the immune system reacts to challenge by an antigen

Integrated Work Control Program (IWCP). The formalized procedures, defined in the Integrated Safety Management Manual, that control work activities from definition to completion

Medical removal protection benefits. The employment rights established by 10 CFR 850 35 for beryllium-associated workers who have temporary or permanent medical removal from beryllium areas following a recommendation by the Site Occupational Medicine Director

Operational area. An area where workers are routinely in the presence of beryllium as part of their work activity

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APPENDIX 1
DEFINITIONS AND ACRONYMS
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Removable contamination. Beryllium contamination that can be removed from surfaces by nondestructive means, such as casual contact, wiping, brushing or washing

Responsible employer. The responsible employer is defined by 10 CFR 850 as any person acting directly or indirectly with respect to terms and conditions of employment of beryllium-associated workers

RFETS Control Level. The airborne and wipe sample level at which this Chapter becomes effective for the Site The airborne level is 0 1 $\mu g/m^3$ as a time weighted average and the wipe sample level is 0 2 $\mu g/100\ cm^2$ Areas that exceed either of these levels, or have the potential to exceed these levels, are posted as Beryllium Controlled Areas and require Beryllium Screened Workers to perform intrusive work

Site. Rocky Flats Environmental Technology Site (RFETS)

Site Occupational Medical Director (SOMD). The physician responsible for the overall direction and operation of the site occupational medicine program

Training, Scheduling, and Records (TSR). The Site central data base of trained personnel

Unique identifier. The part of a paired set of labels, used in records that contain confidential information, that does not identify individuals except by using the matching label

Worker. A person who performs work at the Site

Worker exposure. The exposure of a worker to airborne beryllium that would occur if the worker were not using respiratory protective equipment

1.3 Acronyms

AIHA	American Industrial Hygiene Association
BeLPT	Beryllium-specific lymphocyte proliferation test
BSC	Beryllium Steering Committee
CBD	Chronic Beryllium Disease
CBDPP	Chronic Beryllium Disease Prevention Program
CFR	Code of Federal Regulation
D&D	Deactivation and Decommissioning
DOE	Department of Energy
HEPA	High Efficiency Particulate Air
IHIS	Industrial Hygiene Information System
IS&H	Industrial Hygiene & Safety
IWCP	Integrated Work Control Program
JHA	Job Hazard Analysis
K-H	Kaiser-Hill Company, L L C
LOR	Limit of Reportability
LPT	Lymphocyte proliferation test
NIOSH	National Institute for Occupational Safety and Health
OS&IH	Occupational Safety & Industrial Hygiene

APPENDIX 1
DEFINITIONS AND ACRONYMS
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OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Level
PM	Program Manual
PPE	Personal Protective Equipment
RFFO	Rocky Flats Field Office
SOMD	Site Occupational Medical Director
SME	Subject Matter Expert
TWA	Time Weighted Average
TSR	Training, Scheduling and Records

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ELECTRONIC FORM

APPENDIX 2
OPTIONAL BERYLLIUM WORK FORM

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INDUSTRIAL HYGIENE REQUIREMENTS

BW Form #: _____ *(building-date-unique ID)*

The Beryllium Permit form is to be completed by Industrial Hygiene

SECTION 1 JOB INFORMATION

Building/Room(s) _____ IWCP #: _____
Date(s) of Job _____
enter the building information and date work is to be performed
Prepared by (responsible IH) _____ Phone # ___ Pager # ___
enter name of person filling out this form
Project Supervisor _____ Phone # __ Pager # ___
enter the information of the first line supervisor for the job
Specific task to be performed _____
enter the information on the specific task to be performed
Area Category Beryllium Regulated _____
Beryllium Controlled _____

Section 2 Pre Job Requirements (check all that apply)

Beryllium Worker Y: ____ N ____ Details _____
Beryllium Screened Worker Y ____ N: ____ Details _____
Pre-evolution Briefing Y ____ N ____ **X (Pre-Evolutionary briefing or Pre-Task Briefing as appropriate)**
Training required _____
Other **example Beryllium-induced Lymphocyte Test required prior to work.**

SECTION 3 ENGINEERING CONTROLS, WORK PRACTICES, AND MONITORING REQUIREMENTS TO BE FOLLOWED

[*Include engineering controls and monitoring requirements*]

APPENDIX 2 OPTIONAL BERYLLIUM WORK FORM
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Section 4 PPE Requirements (state type required)

Respirator/Cartridge/Change out frequency

Eyewear

Protective clothing

Hand protection

Foot protection

Other

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APPENDIX 3
BERYLLIUM AUTHORIZATION PROCESS FORM AND CARD INSTRUCTIONS
(Page 1 of 3)

Employee Information section and sections 1 through 4 are to be completed by the Project prior to the BE-LPT Blood Test Appointment

EMPLOYEE INFORMATION SECTION:

Employee or Designated Project Personnel fill out employee and supervisor information at the top of the Be Authorization Process Form and on the front of the Be Card

SECTION 1: JUSTIFICATION (form only)

The justification section must be completed by the Supervisor or Manager justifying a legitimate need for the person to become involved in the Be program because of a Site Policy requiring limitation of the number of Be Workers The supervisor then prints and signs his/her name in the spaces provided and obtains concurrence from a Project Industrial Hygiene (IH) professional The IH professional documents their concurrence by printing and signing their name in the spaces provided

SECTION 2· K-H PROJECT ESH&Q MANAGER APPROVAL (form only)

The K-H Project ESH&Q Manager approves the justification for an individual by printing and signing their name in the spaces provided

> Note If the justification is not approved, the K-H Project ESH&Q Manager is responsible for contacting the employee's supervisor and destroying all Be documentation Some projects do not have the position of ESH&Q Manager In this case the equivalent Safety and Health Position signature is required

SECTION 3: TRAINING VERIFICATION (Complete for both form and card)

A designated person knowledgeable in Be Training requirements shall verify that training is completed via TSR or a certificate of completion and demonstrate this verification by printing and signing their name in the spaces provided The form requires both date of training completion and expiration The Be card requires only the training expiration date

SECTION 4: EMPLOYEE ACKNOWLEDGEMENT (form only)

Upon completion of training and, following concurrence and approval signatures required above, the employee shall print and sign their name indicating the training has been completed, they agree to participate in the RFETS Beryllium Medical Surveillance Program, and they agree to be a Beryllium or Beryllium Screened Worker

APPENDIX 3
BE AUTHORIZATION PROCESS FORM AND CARD INSTRUCTIONS
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Once the form has been completed through section 4, the employee may take the completed Be Authorization Process Form and Be card to the Occupational Medicine Department when the LPT blood work is performed The form and card will not be released until the Be-LPT results are received

SECTION 5: OCCUPATIONAL MEDICINE APPROVAL, TSR ENTRY, AND FINAL DISTRIBUTION

One of the following conditions will apply to the final approval granted by the Occupational Medical Department

Condition 1
If an employee has previously had a negative result (in the past year for a Beryllium Worker, or the past three years for a Beryllium Screened Worker) from a Be-LPT Blood Test

- Medical personnel will enter the date of the Be-LPT Blood test and expiration date as required on the Be Authorization Process Form and the Be Card
- The Doctor will print and sign his/her name on the Be Authorization Process Form and the Be Card
- Medical personnel will make a copy of the original form and mark the original form "Sent to TSR on mm/dd/yy, Building 131 Room 140"
- Medical personnel will send the copy of the Authorization Process Form and, the signed and laminated original Be Card to Training Records for entry into the TSR system
- When TSR receives the copy of the Authorization Process Form and the signed/laminated Be Card, credit will be entered into the TSR system within 1 working day The copy of the Be Authorization Process Form will be filed in the employee's training file as follows

  Be Worker Authorization Process Form
  056-287-52 BE WORKER FINAL MEDICAL APPROVAL – 12 MON REQ

  Be Screened Worker Authorization Process Form
  056-287-53 BE SCREENED WORKER FINAL MEDICAL APPROVAL – 36 MON REQ

Training Records will notify the employee's scheduler or Project Training Manager when the card is ready for pickup

Condition 2
When the blood test results are returned and the test indicates an abnormality, the employee is contacted and another blood draw is taken If the test comes back sensitive a second time, the employee is removed from the Be Program and Medical will provide documentation to the TSR group to remove the employee from the Be Program TSR will give credit in TSR for either "Employee removed from Be Worker Program" or "Employee removed from Be Screen Worker

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APPENDIX 3
BE AUTHORIZATION PROCESS FORM AND CARD INSTRUCTIONS
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Program " If the second test comes back negative the steps in Condition 1 will be followed to complete the process

Condition 3
For personnel who have never been previously tested for Be sensitivity, the blood work results will take between 4 to 6 weeks to be returned Be Authorization Process Forms and/or cards will not be approved until the blood work results are returned The TSR group will not receive the form or the card until after the blood test results are returned Based on the results of the blood work, the steps documented under Condition 1 or 2 above will be followed to complete the process as applicable

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ELECTRONIC FORM

APPENDIX 3
ANNUAL BERYLLIUM WORKER AUTHORIZATION PROCESS
(Page 1 of 3)

Please type or print

Name (First, MI, Last) _____ Employee # _____

Employing Company _____ SSN _____

Project _____ Building _____

Supervisor's Full Name _____ Phone # _____

1. JUSTIFICATION

To be completed by the **Supervisor or Manager** with the concurrence of the appropriate **IH** Explain need for adding this Beryllium Worker or attach official memo. (Note initiating this form means the worker has been interviewed, is not permanently restricted from the use of respiratory protective equipment, and has agreed to enter the Beryllium Worker qualification process)

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Scope of Work, including building(s)

Previous Be Worker
No Previous Be Exposure

Previous Be Exposure (list areas and dates)

I have reviewed the list of current Beryllium Workers and no one with the necessary skill/craft capability is available.

Supervisor/Manager Signature _____ Date _____
Printed Name _____

Industrial Hygiene Signature _____ Date _____
Printed Name _____

2. K-H PROJECT S&IH MANAGER APPROVAL (EG ES&Q MANAGER)

I have read the justification, and in full consideration of the policy to minimize the number of Beryllium Workers, I approve the addition of this worker to the Beryllium Worker Program.

Signature _____ Date _____
Printed Name _____

APPENDIX 3
ANNUAL BERYLLIUM WORKER AUTHORIZATION PROCESS
(Page 2 of 3)

3. TRAINING VERIFICATION

Beryllium Worker Training (#05628801) Date _____ Expiration Date _____
Proof of successful training from Site TSR or training certificate
Verifier _____ Date _____
Printed Name _____

4. EMPLOYEE ACKNOWLEDGMENT

I have attended the required training and agree to participate in the PFETS Beryllium Medical Surveillance Program The health hazards and possible affects of beryllium exposure have been explained to me

Signature _____ Date _____
Printed Name _____

5 OCCUPATIONAL MEDICINE APPROVAL

Present this completed form and the Beryllium Worker Qualification Card (Blue Card) to SOMD when at Medical Surveillance examination and Be-LPT blood draw

SOMD Signature _____ Be-LPT Date _____
Printed Name _____ Expiration Date _____

TSR Tracking Number for Be Worker Be-LPT Test # 056-287-52 OMD to forward a copy of this completed form to Training Records B131.

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BLUE FORMS AND CARDS

Employee completes identification side of Blue Card and takes completed Blue Form and Blue Card to Occupational Medicine for their Be-LPT blood draw appointment

Occupational Medicine ensures all signatures are obtained and signs the Blue Card & Form The original form is filed in the employee's medical file Copies are available to the employee and Project

EXPIRATION DATES AND RENEWAL

It is the employee's responsibility to renew training and blood tests to keep current in the Beryllium program and continue to be a Beryllium Worker **Training** must be completed every two years and **BeLPT blood draws** performed every year

FILING OF THIS FORM
Original Patient's Medical File

APPENDIX 3
ANNUAL BERYLLIUM WORKER AUTHORIZATION PROCESS
(Page 3 of 3)

Print this card on light blue card stock and cut it to fit laminator card sleeves, approximately 2 ¼ by 3 ½ inches

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Beryllium Worker Qualification Card

Name
Employee #
Company

Departmental Approvals

(Appropriate department Sign and note expiration date)

Beryllium Worker Training Verified Initials: _____

Exp. Date _____

SOMD _____

Annual BeLPT Expiration Date _____

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ELECTRONIC FORM

APPENDIX 4
ANNUAL BERYLLIUM SCREENED WORKER AUTHORIZATION PROCESS

(Page 1 of 3)

Please type or print

Name (First, MI, Last): _____ Employee # _____

Employing Company _____ SSN _____

Project _____ Building _____

Supervisor's Full Name _____ Phone # _____

1. JUSTIFICATION

To be completed by the **Supervisor or Manager** with the concurrence of the appropriate **IH** Explain need for adding this Beryllium Screened Worker or attach official memo. (Note initiating this form means the worker has been interviewed, is not permanently restricted from the use of respiratory protective equipment, and has agreed to enter the Beryllium Worker qualification process)

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Scope of Work, including building(s)

_____

_____

_____

_____

_____

_____

Previous Be Worker
No Previous Be Exposure

Previous Be Exposure (list areas and dates)

_____

I have reviewed the list of current Beryllium and Beryllium Screened Workers and no one with the necessary skill/craft capability is available.

Supervisor/Manager Signature: _____ Date _____
Printed Name _____

Industrial Hygiene Signature _____ Date _____
Printed Name _____

2 K-H PROJECT S&IH MANAGER APPROVAL (EG ES&Q MANAGER)

I have read the justification, and in full consideration of the policy to minimize the number of Beryllium Workers, I approve the addition of this worker to the Beryllium Screened Worker Program.

Signature _____ Date _____
Printed Name _____

APPENDIX 4
ANNUAL BERYLLIUM SCREENED WORKER AUTHORIZATION PROCESS
(Page 2 of 3)

3. TRAINING VERIFICATION

Beryllium Worker Training (#05628801) Date _____ Expiration Date _____
Proof of successful training from Site TSR or training certificate
Verifier _____ Date _____
Printed Name _____

4. EMPLOYEE ACKNOWLEDGMENT

I have attended the required training and agree to participate in the RFETS Beryllium Medical Surveillance Program The health hazards and possible effects of beryllium exposure have been explained to me

Signature _____ Date _____
Printed Name _____

5. OCCUPATIONAL MEDICINE APPROVAL

Present this completed form and the Beryllium Screened Worker Qualification Card (Red Card) to SOMD when at Medical Surveillance examination and Be-LPT blood draw

SOMD Signature _____ Be-LPT Date _____
Printed Name _____ Expiration Date _____

TSR Tracking Number for Be Screened Worker Be-LPT Test # 056-287-03 OMD to forward a copy of this completed form to Training Records B131

RED FORMS AND CARDS

Employee completes identification side of Red Card and takes completed Red Form and Red Card to Occupational Medicine for their Be-LPT blood draw appointment

Occupational Medicine ensures all signatures are obtained and signs the Red Card & Form The original form is filed in the employee's medical file Copies are available to the employee and Project

EXPIRATION DATES AND RENEWAL

It is the employee's responsibility to renew training and blood tests to keep current in the Beryllium program and continue to be a Beryllium Worker **Training** must be completed <u>every two years</u> and **BeLPT blood draws** performed <u>every three years</u>

FILING OF THIS FORM
Original Patient's Medical File

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APPENDIX 4
ANNUAL BERYLLIUM SCREENED WORKER AUTHORIZATION PROCESS
(Page 3 of 3)

Print this card on fluorescent red card stock and cut it to fit laminator card sleeves, approximately 2 ¼ by 3 ½ inches

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Beryllium Screened Worker Qualification Card

Name
Employee #
Company

Departmental Approvals

(Appropriate department sign and note expiration date)

Beryllium Worker Training
Verifier Initials: _____
Exp Date: _____

SOMD: _____

Triennial BeLPT Expiration Date: _____

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ELECTRONIC FORM

APPENDIX 5
Beryllium Regulated Area Sign In Log Form
(Page 1 of 1)

Date	Name (Please Print)	Signature	EMPLOYEE # or SSN	Company	IWCP or WORK PKG #	Time in	Time out	Respirator Used? (Yes or No)

ELECTRONIC FORM

APPENDIX 6
Beryllium Controlled Area Sign In Log Form

(Page 1 of 1)

Date	Name (Please Print)	Signature	EMPLOYEE # or SSN	Company	IWCP OR WORK PKG #	Time in	Time out	Respirator Used? (Yes or No)

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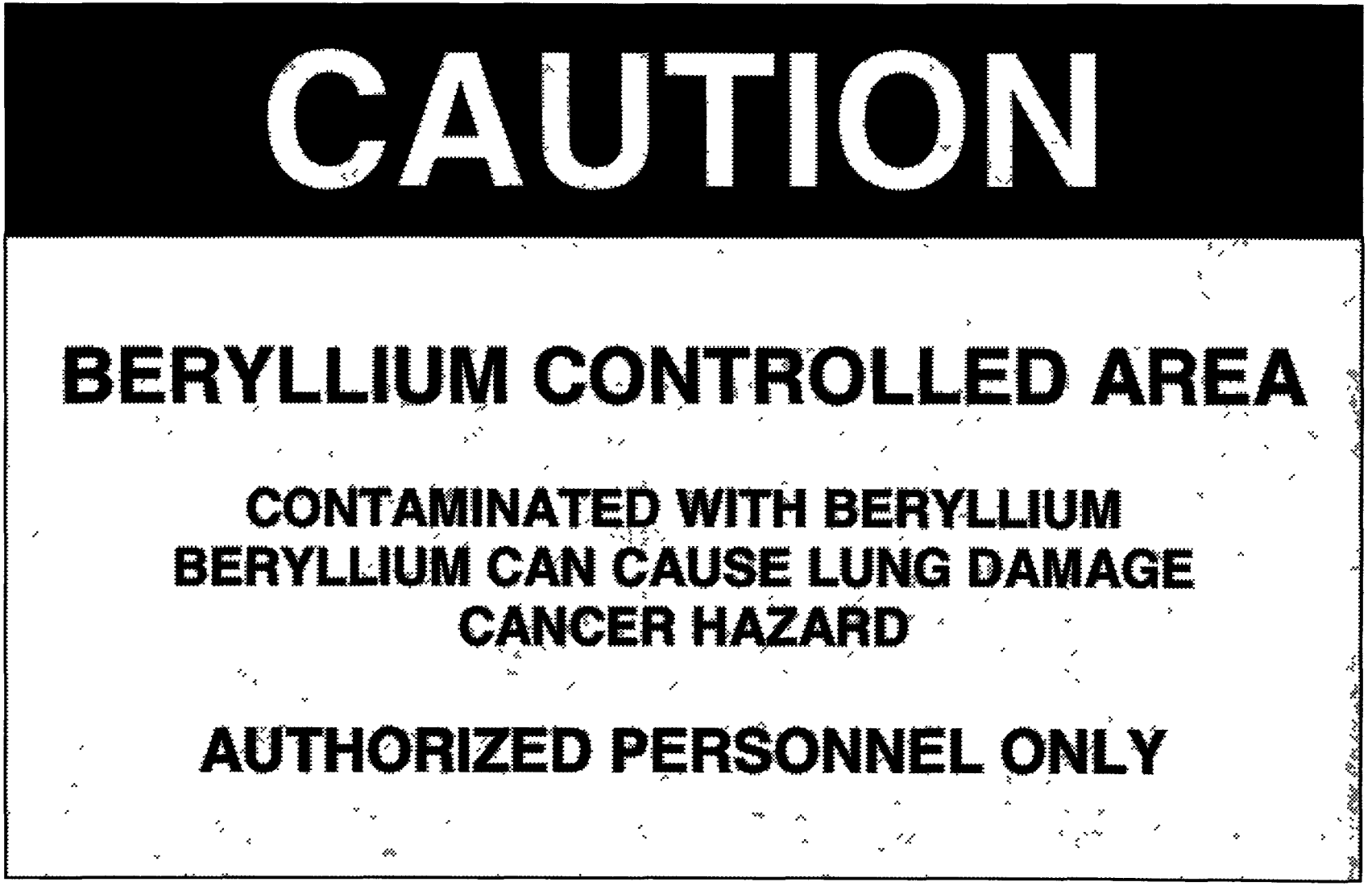
APPENDIX 7
SIGNS
(Page 1 of 4)

APPENDIX 7
SIGNS
(Page 2 of 4)



APPENDIX 7
SIGNS
(Page 3 of 4)

NOTICE

POTENTIAL BERYLLIUM CONTAMINATED EQUIPMENT &/OR SYSTEMS

SYSTEMS OR EQUIPMENT IN THIS BUILDING MAY CONTAIN BERYLLIUM

SAFETY ASSESSMENT REQUIRED PRIOR TO INTRUSIVE WORK ACTIVITIES

APPENDIX 7
SIGNS
(Page 4 of 4)

PPE REQUIRED

PPE REQUIREMENTS FOR ENTRY

FF RESPIRATOR*
TYVEK SUIT
HOOD
DOUBLE OUTER BOOTIES
DOUBLE OUTER GLOVES

CONTACT IH PRIOR TO ENTRY

***Respirator must be wiped and bagged as beryllium contaminated**

APPENDIX 8
LABELS
(Page 1 of 1)